

MONTANA
DEPARTMENT
OF
HIGHWAYS

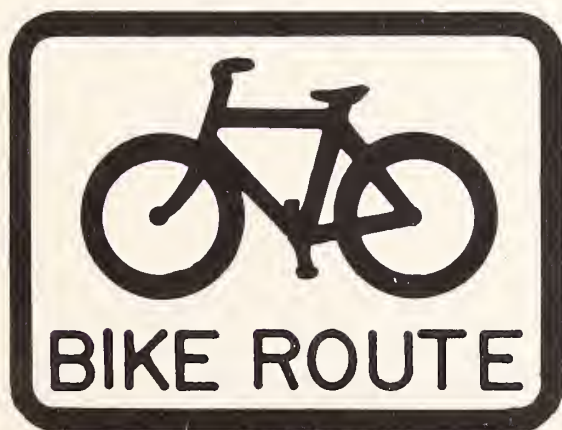
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POLICY AND GUIDELINES
FOR
BICYCLE ROUTES
AND FOOTPATHS

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INTRODUCTION

There is beginning to be more and more interest shown in the provision of bicycle routes and/or foot paths along Montana's highways.

The problem is now reaching the magnitude where policies and guidelines regarding the matter are needed.

A recently passed law in Oregon requires that they spend not less than 1% of their state highway funds for the establishment of footpaths and bicycle routes. They have, therefore, developed standards and guidelines for such facilities. Much of what is included in this pamphlet has been taken from what Oregon has developed.

Policy and procedure memorandum 21-23 dated March 14, 1973 is included in Appendix A. This gives the Federal Highway Administration rules and regulations regarding bicycle routes along Federal-aid system highways.



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PURPOSE

The purpose of this pamphlet is to set forth the policy of the Department of Highways in regard to providing bicycle routes along Federal-aid facilities.

POLICY

It is the policy of the Montana Department of Highways to provide bicycle routes or foot paths in conjunction with highway projects whenever:

- A. There is a clear interest and need.
- B. The provision of such facilities will not substantially increase the cost of the proposed highway project.
- C. Such facilities will not reduce the capacity or safety of the highway to be constructed.
- D. The facility is a supplemental part of a highway improvement which would otherwise be eligible for federal aid funding and is constructed concurrently.

GENERAL

In general, there are three categories of bicycle routes.

CATEGORY 1

The first category involves those bicycle routes which are provided within the highway right-of-way, but not immediately adjacent to the roadway and is the most desirable.

Normally, these will be on one side or the other of the roadway and will necessarily involve two-way operation.

Figures 1 and 2 show this category of bicycle route.

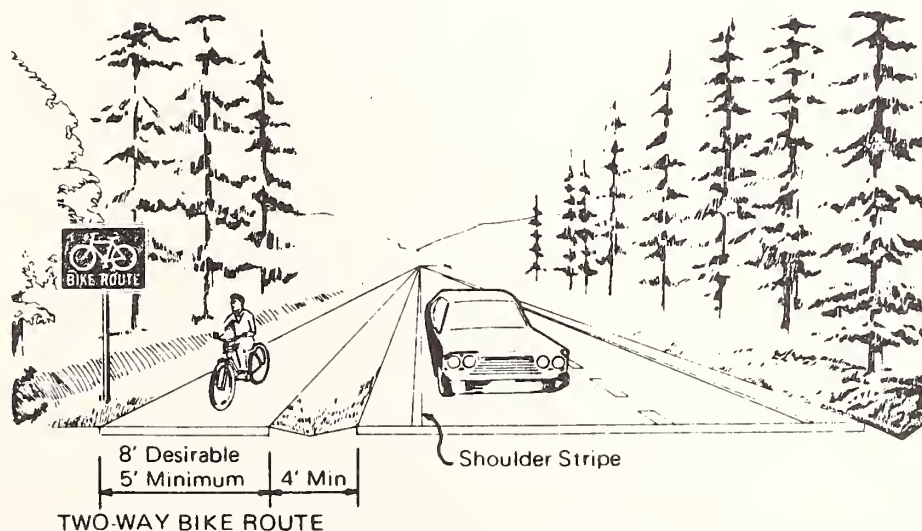


FIGURE 1

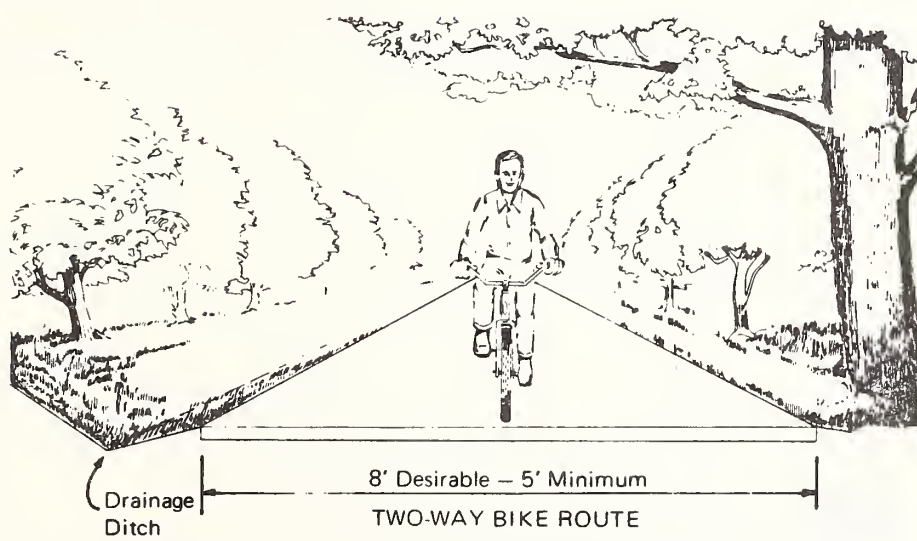


FIGURE 2

CATEGORY 2

The second category involves those bicycle routes that are provided adjacent to the road or street, but are physically separated from it by curbs or guardrail.

These can be provided on one or both sides of the road or street and operation can be one-way or two-way. Normally, where bicycle routes are provided on both sides, the operation will be one-way. However, where one is provided, it naturally must have two-way operation.

Figures 3, 4, and 5 show this category of bicycle route.

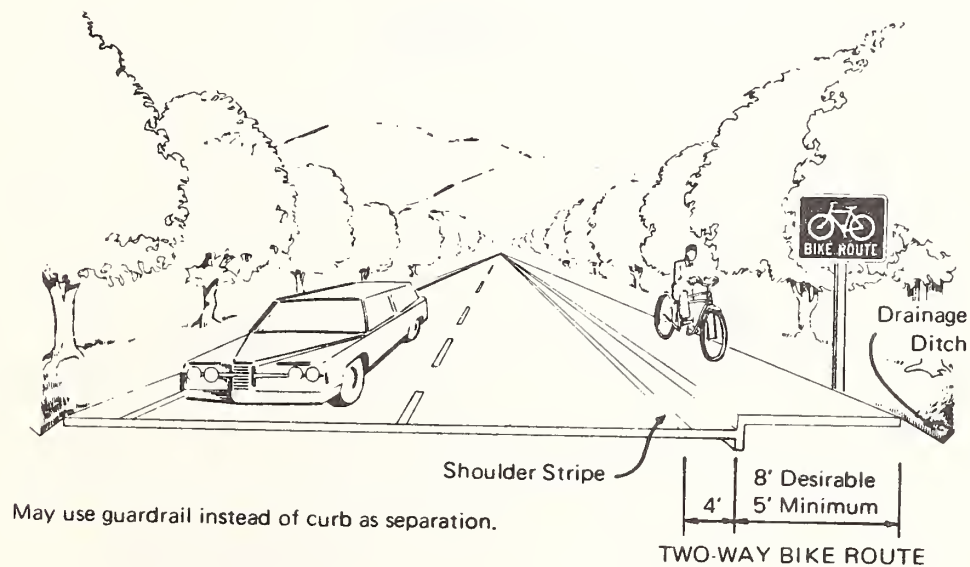
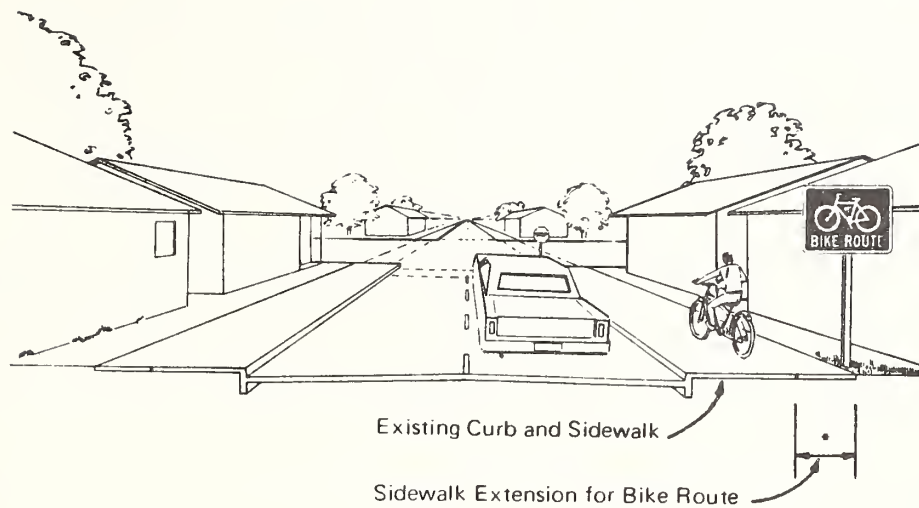


FIGURE 3



*2' to 3' (4' to 5' where poles or mailboxes are located in sidewalk).

ONE-WAY BIKE ROUTE EACH SIDE OF STREET

FIGURE 4

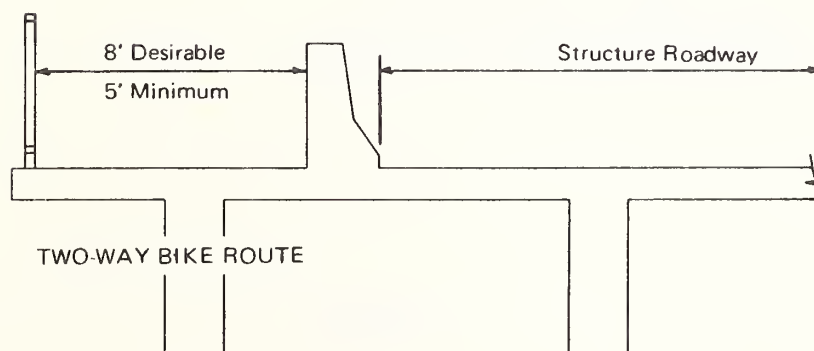


FIGURE 5

CATEGORY 3

The third category merely involves widening the pavement to provide for bicycle operation. The only separation between the road or street and the bicycle route is paint. Normally, there will be a one-way bicycle route on each side of the road or street.

Figures 6 and 7 show this category of bicycle route.

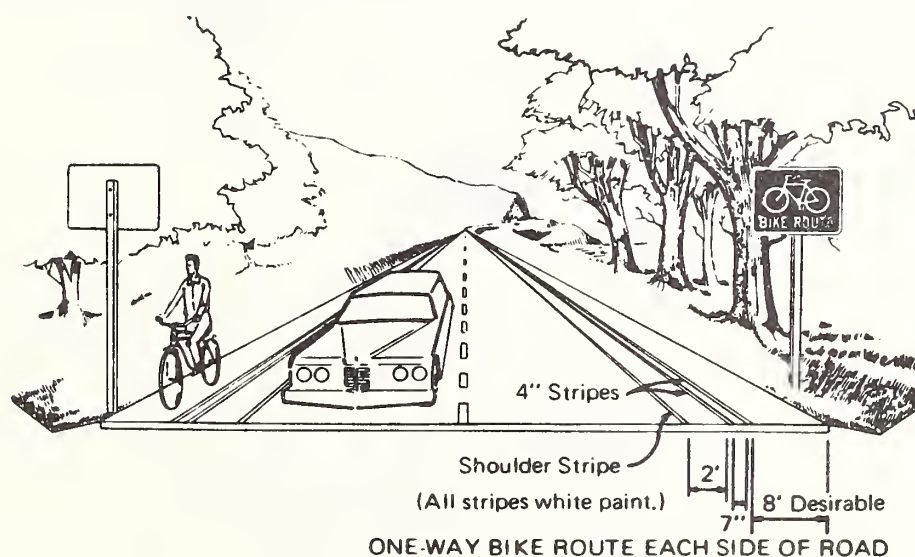
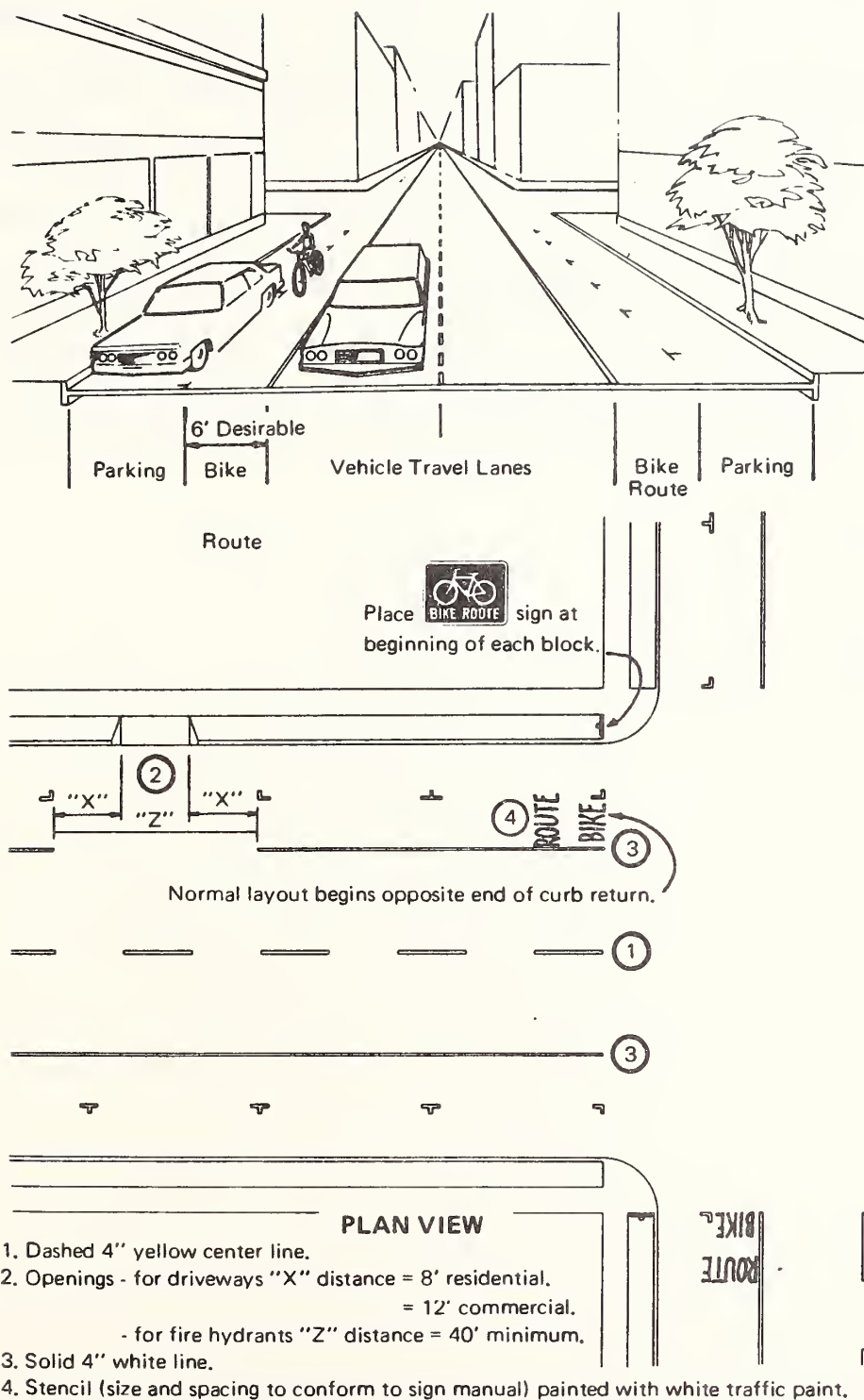


FIGURE 6



ONE-WAY BIKE ROUTE EACH SIDE OF STREET

FIGURE 7

Category No. 3, being the least expensive to build and maintain, is also the least desirable from a standpoint of safety. There could be voluntary or involuntary movements of vehicular or bicycle traffic into the other traffic lane. Also, a conflict may arise between bicycles and persons opening doors of parked vehicles. Use of this category should be refrained from, and if used at all, only when it is not feasible to provide something better. Concurrence by the Federal Highway Administration must be secured prior to incorporation of such a design into the planning of any Federal Aid project.

PLANNING

One of the first steps in the planning of a bicycle route or foot path is the determination of the interest and need for such a facility. Accomplishment of the following should help in that determination.

- A. Consult with law enforcement agencies for city and county statutes and for auto-bike conflicts and problems.
- B. Interview school officials and school safety committees for determining cycling patterns in the community.
- C. Consult with local planning personnel.
- D. Request opinions from civic organizations and service clubs.
- E. Request input from cycling clubs in the community.
- F. Consult authorities in other communities and states.
- G. Review state and local outdoor recreation plans.

When it has been established that there is interest and a need and that the bicycle route will be provided in conjunction with a highway construction project, the actual planning for the path can proceed.

Consideration must also be given as to maintenance of the route. It will be necessary that a written agreement be developed as to who (agency or organization) will maintain the route or path. The agreement could be between the state, county, city, city sponsored civic group, or bike club or a combination of these agencies

and organizations. Any bike clubs or civic groups should be sponsored by a governmental agency.

A bicycle route or foot path, while providing a means for reaching one point from another would also provide, wherever possible, access to parks, viewpoints, or other items of interest. It should provide an interesting walk or ride. The following are some items that should be considered in trail development.

- A. Terrain
- B. Vegetative cover, open areas, deep woods
- C. Lakes, streams, ponds, rivers, waterfalls
- D. Geologic formations
- E. Other highways
- F. Canals, utilities
- G. Railroads
- H. Historic sites
- I. Rest areas
- J. Shopping centers
- K. Bridges
- L. Parks
- M. Schools

If a route cannot pass close to or through an item of interest, a spur or connecting loop may be considered as an addition to the main route to create diversity and stimulate interest.

Generally speaking, the proposal should be in excess of five miles in length to assure continued interest and utilization by the bicyclist. If the proposal serves largely commuting traffic,

and if large sources of generators of use (e. g. schools, shopping centers) are present at the termini, short distance and direct routes may become a primary consideration.

Ideally, a bicycle route should serve a commuting and overall transportation use with segments or all of that route being used for recreation purposes.

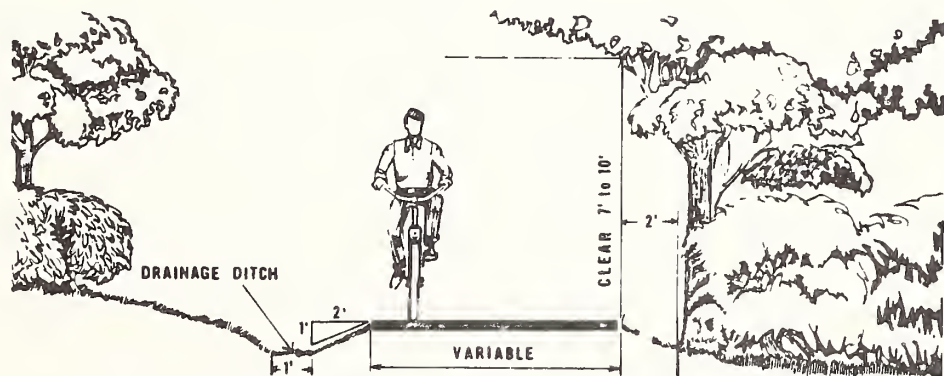
Other proposals may specifically serve the racing and competition bicyclists.

DESIGN

The following should be used as a guide in the design of bicycle routes:

A. Clearing

Vegetation should be cleared to a minimum of two feet from the edge of the surfacing. Overhead clearance should be maintained for a seven-foot minimum and ten feet is preferable. All dead branches and trunks should be removed from above the trail. All vegetation, including roots, on the subgrade should be removed down to bare earth.



TYPICAL SECTION SHOWING CLEARING & DRAINAGE

B. Drainage

Drainage should be properly handled to prevent washouts and to avoid ground saturation beneath the route. The route should be sloped to provide runoff and ditches should be provided where necessary. Under-drains may be necessary in very wet places to prevent frost action with resultant heaving.

In special instances, catch basins and drains may be needed.

C. Horizontal and Vertical Alignment

Development of the horizontal alignment for a bicycle route is, in many respects, similar to such development for highways, roads, or streets. Where the bicycle route is to be adjacent to a proposed highway, it assumes the same alignment with some minor deviations to create interest. The extent of deviation would be dependent upon topography, culture, and available right-of-way. It is important to recognize that routes not contiguous to a road or street are not bound by the alignment of the road or street and freedom in alignment is allowed under these conditions. The bicycle routes in this instance can follow the terrain to keep cuts and fills to a minimum and to insure proper drainage of the trail. It may be desirable to split the route creating a "one-way" condition to avoid trees or other obstacles and to add interest to the trail. Curve radius should be selected to provide a smooth transition in the change of direction. In some instances where the angle between adjacent tangents is slight (10° or less), curves are not necessary. Short, sharp curves and sharp angles should be avoided if possible, particularly in areas where high speeds can be attained (e.g. at the bottom of a long descending grade). Opportunities should be given to permit the cyclist to slow down and not brake while in the curve.

A bicycle is a versatile machine and is capable of negotiating a six-foot radius; however, for design purposes, a minimum turning radius of 20 feet should be assumed.

Grades should vary on a bicycle route, particularly one serving recreation cyclists. The main condition to avoid is long, steep uphill grades. A 15% uphill grade for short distances may be considered an absolute maximum, while 10% grade is a desirable maximum. The grade and its length must be judged together. The long climb, even though gradual, should be avoided.

D. Width

The recommended width for bicycle routes is eight feet, but heavily used, urban bicycle routes can exceed this width. For a two-way bicycle facility, the minimum width is five feet. Where conditions warrant one-way routes, sections with widths of three to four feet would be considered adequate, but minimal.

If the bicycle route is to be established in conjunction with sidewalks, it is desirable to add extra width to accommodate bicycles. A minimum of two feet to four feet is recommended, generally extending the total width of the sidewalk to seven to ten feet.

E. Bridges

Bridges should be about the same width as the bicycle routes they connect, particularly if two-way traffic is to be accommodated. Therefore, eight feet is desirable and five feet is minimum.

Consideration should be given to pull-off areas either on or near the bridge to take advantage of scenery or other interesting features of the crossing.

F. Surfacing

In most instances, vehicles will be used for maintenance, so the base design will need to be of adequate quality to support maintenance vehicles.

The base course, depending upon locality, methods, etc., may consist of crushed stone or other appropriate materials.

Bicycle routes should be surfaced with about two inches of bituminous material. This is in addition to the base, which will normally consist of about six inches of gravel.

G. Right-of-Way

Width of right-of-way will vary considerably and, as a minimum, needs only to be as wide as the route itself. In most cases, this minimum should be surpassed. Where scenic qualities, anticipated use, and/or physical features warrant, right-of-way may be extended considerably. Generally 15 feet should be considered a working minimum.

SIGNING

All signs and markings must conform to the MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, 1971 edition.

BIKE ROUTE

- A. Use - A nationally approved sign for marking an officially designated bicycle route, appropriate both where a route is separate from a street or highway and where a route may be routed on selected roads or streets.
- B. Material - Alloy aluminum or any other suitable metal, plastic, or high-density plywood.
- C. Finish - Reflectorized if to be used at night by bicycles and automobiles, but otherwise not required.
- D. Colors - Standard Interstate Green, White.
- E. Gauge of Metal - Suggested: .064".
- F. Dimensions - 24" x 18" mounted as horizontal rectangle.
- G. Design - A bicycle symbol; the words BIKE ROUTE in 3" series C letters.
- H. Category - "Guide" or "Trail Blazer".



XING

- A. Use - A nationally approved sign for placement on a street or highway just in advance of a point where an officially designated bicycle route crosses the roadway.
- B. Material - Alloy aluminum or any other suitable metal, plastic, or high-density plywood.
- C. Finish - Reflectorized material as in warning signs if it must be effective at night.
- D. Colors - Standard Highway Warning Yellow, Black.
- E. Gauge of Metal - Suggested: .080".
- F. Dimensions - 30" x 30" mounted as a diamond.
24" x 18" mounted as a horizontal rectangle.
- G. Design - A bicycle symbol, the term XING in 6" series D letters. "X" substitutes for "cross", shortening the word "crossing".
- H. Category - "Warning".



APPENDIX A



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
WASHINGTON, D.C. 20590

POLICY AND PROCEDURE MEMORANDUM

Transmittal 285
March 14, 1973
HNG-1

1. MATERIAL TRANSMITTED

PPM 21-23, Bicycle Routes Along or Crossing Federal-aid Highways.

2. EXISTING ISSUANCES AFFECTED

This is a new issuance.

3. COMMENTS

This memorandum sets forth the policies and procedures of the Federal Highway Administration relating to the provision or inclusion of facilities for bicycle operation on Federal-aid highways, and Federal-aid and Federal fund participation in the cost of providing such facilities.

A handwritten signature in cursive script, reading 'R. R. Bartelsmeyer', is positioned above the typed name.

R. R. Bartelsmeyer
Acting Federal Highway Administrator

Distribution:
Basic

POLICY AND PROCEDURE MEMORANDUM

Transmittal 285

21-23

March 14, 1973

BICYCLE ROUTES ALONG OR CROSSING FEDERAL-AID HIGHWAYS

- Par. 1. Purpose
2. Definitions
3. Background
4. Policy
5. Planning
6. Applicability of Existing Law, Regulation and Directives
7. Funding
8. Federal-aid Participation in Trail Facilities and Appurtenances
9. Trails Within the Right-of-Way of Existing Federal-Aid Highways
10. Design Criteria for Trails
11. Shared Roadways
12. Trails for Equestrians, Hikers and Other Nonmotorized Transportation Modes

1. PURPOSE

This memorandum sets forth the policies and procedures of the Federal Highway Administration (FHWA) relating to the provision or inclusion of facilities for bicycle operation on Federal-aid system highways and Federal-aid and Federal fund participation in the costs of providing such facilities.

2. DEFINITIONS

- a. Bicycle - A device propelled exclusively by human power upon which any person may ride, having two tandem wheels.
- b. Bicycle Route - A continuous pathway designated for use by bicycles (including three-wheel cycles); it variously may follow a bicycle trail, a shared roadway or a sidewalk where such use is sanctioned.
- c. Bicycle Trail - A separate pathway provided for the use of bicyclists. Where it parallels a highway it is separated from the roadways for motor vehicular traffic by an open space or barrier.
- d. Shared Roadway - A portion of a roadway which is designated for use by bicycles. The particular portion of the roadway may either be shared with motor vehicles or be designated for use by bicycles only.

3. BACKGROUND

There is a growing interest in bicycling for recreational and other trip purposes.

Where this activity occurs on the roadways of high speed and/or high volume highways both safety and efficiency are seriously impaired because of the dangerous mixture of motorized and nonmotorized modes of travel. Provision of bicycle trails separate from the vehicular traffic roadways will promote safety and will assist in retaining the motor vehicle carrying capacity of the highway while adding new bicycle capacity.

4. POLICY

It is the policy of the FHWA to encourage the provision of bicycle trails (as defined above) as parts of Federal-aid highway projects wherever conditions are favorable and a public need will be served. Accordingly, the work to construct bicycle trails may be approved by the Division Engineer where all of the following conditions are satisfied:

- a. The trail is constructed in conjunction with, and concurrently with, a Federal-aid highway improvement, including reconstruction projects.
- b. The trail is located and designed so as not to reduce the safety to motorists or pedestrians or create a hazard for bicyclists.
- c. The trail will constitute a usable facility, having termini that are accessible to users, or will form a segment of such a facility located and designed pursuant to an overall plan of transportation development.
- d. There is an agreement by a public agency for the operation and maintenance responsibilities for the trail.
- e. The trail is within the right-of-way of a Federal-aid highway. This includes, but is not limited to, Federal-aid right-of-way acquired under the provisions of 23 U.S.C. 319 (Landscaping and Scenic Enhancement), 23 U.S.C. 135 (Urban Area Traffic Operations Improvement Programs) and PPM 80-1 (Right-of-Way Procedures (General Principles and Coordination with Other Government Agencies)).
- f. There is reasonable expectancy that the trail will have sufficient use in relation to its cost to justify expenditure of Federal-aid and other public funds in its construction and operation.

5. PLANNING

Individual bicycle trails should in most cases be planned as parts of a larger system of trails and this system of trails in turn may form portions of an overall bicycle transportation system. Where 3-C planning operations (i. e. continuous comprehensive transportation planning process carried on cooperatively as set forth in PPM 50-9 (Urban Transportation Planning)) are in progress, consideration should be given to including bicycle trails as parts of the areawide transportation plan. Planning for bicycle trails is eligible for financing with planning and research funds as provided in 23 U. S. C. 307(c).

6. APPLICABILITY OF EXISTING LAW, REGULATION AND DIRECTIVES

Bicycle trail construction is to be done as an element of a Federal highway project. Accordingly, the provisions of 23 U. S. C. apply directly and normal Federal-aid procedures established by existing Policy and Procedure Memorandums are to be followed. This shall include, but not be limited to applicable sections pertaining to the following: equal employment opportunity, labor provisions, maintenance requirements and utility adjustment.

7. FUNDING

All classes of Federal-aid and Forest Highway and Public Lands Highway Funds are available for participation in the costs of construction of trails when located on an applicable Federal-aid system. Federal-aid funds may not be used for the independent purchase of additional rights-of-way for the sole purpose of accommodating bicycle trails.

8. FEDERAL-AID PARTICIPATION IN TRAIL FACILITIES AND APPURTENANCES

a. General - There may be Federal participation in the construction of trails for the grading, drainage, paving, traffic control devices, appurtenances, barriers, landscaping and structures, as necessary to accommodate the types and numbers of users expected on the trail.

b. Structures - As is found necessary for the development of a trail, Federal-aid funds may be used for walls, railings, additional width of bridges at overpasses and additional lengths of bridges at underpasses for trail continuity. Federal-aid funds may also be used to build highway-trail grade separations where:

(1) Vehicular speeds and crossing volumes are sufficiently high as to be judged to constitute a hazard to both trail users and motor vehicle traffic and the trail cannot be rerouted to provide a crossing via some other type separation structure, or

(2) The separation is necessary because the highway facility has complete control of access.

Washington Headquarters approval is required where it is proposed to route a trail over a sizable structure such as a major stream crossing or viaduct.

c. Appurtenances - It is not expected that there will be extensive provision of supplementary facilities such as bicycle racks, shelters, comfort stations, small parking areas, etc. However, where such facilities are found necessary for the safety and health of users, consideration may be given to providing such facilities as a part of trail development projects.

d. Traffic Control Devices - Necessary traffic control devices including signs, signals and pavement markings in accordance with PPM 21-15 (Traffic Control Devices on Federal-Aid and Other Streets and Highways) required for proper and safe utilization of a new or existing trail erected in conjunction with a highway improvement project may be financed with Federal-aid funds of the same class as the highway improvement itself.

9. TRAILS WITHIN THE RIGHT-OF-WAY OF EXISTING FEDERAL-AID HIGHWAYS

Approval is not to be given for Federal-aid highway projects that cover work only for the development of a bicycle trail along an existing Federal-aid highway unless such work is to be in conjunction with a highway improvement project. Where trails are provided by other agencies within existing Federal-aid highway rights-of-way, it is expected that they will comply with paragraphs 4b, c and d.

10. DESIGN CRITERIA FOR TRAILS

a. Trails should be designed and constructed in a manner suitable to the site conditions and the anticipated extent of usage. In the absence of national standards, the Division Engineer may determine the acceptability of proposed standards or design criteria for trail construction. In general, a bicycle trail should be designed with an alignment and profile suitable for bicycle use, with a surfaced pathway that will be reasonably durable, incorporate drainage as locally necessary and be of a width

appropriate for the planned one-way or two-way use. Where the trail crosses a street or highway at grade the location should be such as to insure adequate sight distance and the design should include traffic control devices for both the motor vehicle and bicycle traffic as necessary for safe operations.

b. Trails should be separated from the roadways a sufficient distance so that the vehicular roadway is not readily accessible to trail users. Where acceptable separation of the trail from the roadway cannot be otherwise attained, a barrier sufficient to discourage trail users from using the vehicular lanes should be erected. Where a bicycle trail along a highway crosses a natural barrier or a transportation route for which a grade separation is necessary, practical alternate structure treatments should be considered. It may be in order to align the trail so as to utilize a highway structure (widened as needed) and with a barrier separation rather than provide a more expensive separate trail overpass or underpass structure.

11. SHARED ROADWAYS

a. Because of potential hazard to both bicyclists and motorists, proposals for the development of bicycle routes on existing streets and highways should be carefully reviewed. Shared roadway arrangements that result in bicycles operating on the through lanes or shoulders of high-speed or high-volume highways or operating in the lanes of high-volume streets should not be allowed. Within cities, streets can be used to provide reasonably safe bicycle lanes only along low-volume thoroughfares.

b. It is recognized that bicycle operations are governed by State codes and local regulations and ordinances. Where local ordinances permit and pedestrian volumes are not high, utilization of existing sidewalk systems together with proper intersection treatments may be suitable segments for bicycle routes.

12. TRAILS FOR EQUESTRIANS, HIKERS AND OTHER NONMOTORIZED TRANSPORTATION MODES

In some local areas, additional separate facilities for pedestrians, equestrians and possibly other individually operated units may be necessary. Where they constitute reasonably proper parts of a highway project these other types of trail facilities should be included. Since they largely are special case conditions, general policy statements are not in order. In general, the provisions herein for bicycle facilities are applicable for their inclusion in highway projects.



R. R. Bartelsmeyer
Acting Federal Highway Administrator

